able to ascend, but require time in order to unite into larger gas bubbles. Finally, in general there are no more bubbles formed, but there still remains suspended in the liquid an amount of gas in the form of minute gas bells. By powerful disturbance, one can drive out a great proportion of the gas, because hereby the resistance of the liquid against the escape of the gases is diminished, and the minute particles of gas are given the possibility of more quickly reaching each other.

The removal of carbon from iron as carbon-monoxide takes place in quite similar manner. Pig iron with its carbon content of 3 to 4 per cent, may be regarded as a concentrated solution of carbon ; and slag with an iron content of 30 per cent, or more, as a concentrated solution of active oxygen. At the contact surface, there results a formation of carbon monoxide in the state of bubbles of gas which seek to ascend, in which they are hindered by the viscosity of the slag. This is thereby forced from the contact surface of the metal. Soon, however, the gas bubbles are able to force their way through the slag, and this finally thereby closes under them and again comes in contact with the metal, whereby the process begins anew. The passage of the bulk of the resulting gas bubbles through the slag is, however, owing to the consistency of the same, considerably delayed, and this is the cause of the slag becoming frothed up and itn volume considerably increased. In this connection, II. II. Campbell states on p. 211, "From the time that the metal is thoroughly melted, when it may contain about 8 per cent, of carbon, until the proportion is reduced to about IJ per cent., the bath resembles soda water more than pig iron, and it trion to flow out of the doors and to occupy about twice the room it should."

The previously described course of the removal of the carbon is nowadays to be seen only in few works, since it is not frequently that molten metal with such high carbon content is worked in open-hearth furnaces.

On the other hand, one can observe the second quieter period of the carbon removal, which begins with a carbon content of about 1"5 per cent, and less, in the normal coureo in all open-hearth furnace charges.